



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,740	09/29/2000	Mitsuhiro Shibazaki	000635	2061
38834	7590	01/25/2005	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			CHANG, SUNRAY	
			ART UNIT	PAPER NUMBER
			2121	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

09/671,740

Applicant(s)

SHIBAZAKI, MITSUHIRO

Examiner

Sunray Chang

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

Art Unit: 2121

**DETAILED ACTION**

1. This office action is in responsive to the paper filed on September 22<sup>nd</sup>, 2004.
2. Claims 1 – 10 are presented for examination.

Claims 1 – 10 are rejected.

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1 – 10 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Yoshihiko Kimura [JP 406304805, (forth office action cited) and referred to as Kimura hereinafter], and in view of David P. Little (SpiroGraph, <http://www.math.dartmouth.edu/~dlittle/java/SpiroGraph/>, 1997, and referred to as Little hereinafter).

Art Unit: 2121

(Kimura as set forth above generally discloses the basic inventions.)

4. **Regarding independent claims 1 – 10,**

Kimura teaches, boring a hole having a shape [form a square shape hole] defined by the contour of the regular N-polygonal figure [square]. [Abstract, Fig. 2 – 12]

Kimura does not teach,

- The center point (S) of a regular N – polygonal figure to be determined is set as a fixed point; a point, which is distant by a certain length from the said center point (S) and revolves around the center point (S), is set as a first point (E); a point, which is distant by a certain length from the first point (E) and revolves around the first point (E), is set as a second point (M);
- The second point (M) revolves around the first point (E) at an angular velocity  $\omega$ , that the first point (E) revolves around the center point (S) at an angular velocity  $(1 - N) \omega$ , that the first point (E) is away from the center point (S) by a distance ( r ), and that the second point (M) is away from the first point (E) by a distance  $(N - 1)^2 r$ , the locus of the second point (M) defines a contour of a regular N – polygonal figure to be determined being circumscribed on a circle having a radius  $N(N - 2) r$ .

Little teaches,

- Little teaches the center point (S) [origin, Line 18, Page 1] of a regular N – polygonal figure [Square in Fig. 1, Page 2] to be determined is set as a fixed point [origin, Line 18, Page 1]; a

Art Unit: 2121

point  $[(R + r, 0)$ , Line 20, Page 1], which is distant by a certain length  $[R + r$ , Line 20, Page 1] from the said center point (S) [origin, Line 18, Page 1] and revolves around [large circuit in Fig. 1, Page 2] the center point (S) [origin, Line 18, Page 1], is set as a first point (E)  $[(R + r, 0)$ , Line 20, Page 1]; a point [reflector, Line 22, Page 1], which is distant by a certain length [Distance of Point, Line 22, Page 1] from the first point (E)  $[(R + r, 0)$ , Line 20, Page 1] and revolves around [small circuit in Fig. 1, Page 2] the first point (E)  $[(R + r, 0)$ , Line 20, Page 1], is set as a second point (M) [reflector, Line 22, Page 1];

- Further, Little teaches the second point (M) revolves around the first point (E) at an angular velocity  $\omega$ , that the first point (E) revolves around the center point (S) at an angular velocity  $(1 - N) \omega$ , that the first point (E) is away from the center point (S) by a distance  $(r)$ , and that the second point (M) is away from the first point (E) by a distance  $(N - 1)^2 r$ , the locus of the second point (M) defines a contour of a regular  $N$  - polygonal figure to be determined being circumscribed on a circle having a radius  $N(N - 2) r$ .

By

$$X(t) = (R + r) \cos(t) - p \times \cos((R + r)t/r)$$

$$Y(t) = (R + r) \sin(t) - p \times \sin((R + r)t/r)$$

Multiplied by a constant angular velocity  $\omega$

$$\theta = \omega t$$

(Note: Function in the time domain are the same when written in the frequency domain and Official

Notice is taken of this fact.)

We can get

Art Unit: 2121

$$X(\theta) = (R + r) \cos(\theta) - p \times \cos((R + r) \theta / r)$$

$$Y(\theta) = (R + r) \sin(\theta) - p \times \sin((R + r) \theta / r)$$

Base on

Second point (M) revolves around first point (E) at angular velocity  $\omega$

First point (E) is away from the center point (S) by a distance (r)

According to the value of  $k = 1 - N$  is a result of the initial value being set to  $2\pi - (2\pi / N)$  which is an arbitrary value. It is inherent for a person with ordinary skill in the art to get the same results as:

- Angular velocity of the first point (M) is  $(1 - N) \omega$  is constant.
- Second point (M) is away from first point (E) by distance  $(N - 1)^2 r$  which is derived from the initial value of  $2\pi - (2\pi / N)$ .
- The locus of the second point (M) defines a contour of a regular N – polygonal figure to be determined being circumscribed on a circle having radius  $N(N - 2) r$  which is derived from the initial value of  $2\pi - (2\pi / N)$ .
- It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Kimura to include "The center point (S) of a regular N – polygonal figure to be determined is set as a fixed point; a point, which is distant by a certain length from the said center point (S) and revolves around the center point (S), is set as a first point (E); a point, which is distant by a certain length from the first point (E) and revolves around the first point (E), is set as a second point (M); The second point (M) revolves around

Art Unit: 2121

the first point (E) at an angular velocity  $\omega$ , that the first point (E) revolves around the center point (S) at an angular velocity  $(1 - N) \omega$ , that the first point (E) is away from the center point (S) by a distance  $(r)$ , and that the second point (M) is away from the first point (E) by a distance  $(N - 1)^2 r$ , the locus of the second point (M) defines a contour of a regular  $N -$  polygonal figure to be determined being circumscribed on a circle having a radius  $N(N - 2)r$  for the purpose of drawing a square shape locus.

**Response to Amendment**

**Specification**

5. Applicants' amendment overcomes the objection to specification. The objection has been withdrawn.

**Claim Rejections - 35 USC § 101**

6. Applicants' amendment overcomes claims to avoid 35 USC § 101 rejections. The rejections have been withdrawn.

**Claim Rejections**

**Claim Rejections - 35 USC § 102**

7. Applicants' argument regarding "Little does not disclose any of the recited features in claims 2, 3, 7 and 8" [Page 13, lines 2 - 3] is disagreed with. Independent claim 1 claims a well-

Art Unit: 2121

known orbit model, claims 2, 3, 7 and 8 using contour to replace it, theoretically, both groups are structured based on the same theory. Rejections related with this argument *are still retained* ~~retain still~~.

11/14/05

**Conclusion**

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunray Chang whose telephone number is (571) 272-3682. The examiner can normally be reached on M-F 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2121

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-746-3506.

Sunray Chang  
Patent Examiner  
Group Art Unit 2121  
Technology Center 2100  
U.S. Patent and Trademark Office

January 10, 2005



**Anthony Knight**  
**Supervisory Patent Examiner**  
**Group 3600**